

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) An ultrasound system comprising:

an ultrasound probe comprising a plurality of transducer elements configured for sensing ultrasound signals and converting the ultrasound signals to analog electrical signals, the ultrasound probe configured for transmitting the analog electrical signals configured for sensing and transmitting analog electrical signals; and

an optical conduit comprising an electro-optic modulator configured for

(a) receiving the analog electrical signals,

(b) receiving optical signals from a light source, and

(c) modulating the optical signals with the analog electrical signals;

wherein the optical conduit is configured for transmitting the modulated optical signals to an optical detector, configured for coupling a light source and a optical detector in an optical path;  
wherein the optical conduit comprises electro-optic modulators configured for modulating optical signals on the optical conduit with at least one of the analog electrical signals configured to generate corresponding optically-modulated analog signals on the optical conduit.

2. (Original) The ultrasound system of claim 1, wherein the electro-optic modulators comprise a polymer material.

3. (Original) The ultrasound system of claim 2 wherein the electro-optic modulators comprise silicon.

4. (Original) The ultrasound system of claim 2, wherein the ultrasound probe further comprises an amplifier configured for amplifying the analog electrical signals.

5. (Original) The ultrasound system of claim 2, wherein the optical conduit further comprises: a plurality of multiplexers, each configured for coupling a corresponding one of the electro-optic modulators and a corresponding set of the transducer elements and conducting electrical signals of a selected one set of transducer elements to the corresponding one of the electro-optic modulators.

6. (Currently Amended) The ultrasound system of claim 5 1, wherein the ultrasound system further comprises a plurality of demultiplexers configured for demultiplexing the optically modulated analog signals received from the electro-optic modulators.

7. (Original) The ultrasound system of claim 1, wherein the ultrasound probe further comprises a plurality of cooling lines configured for maintaining a probe temperature.

8. (Original) The ultrasound system of claim 1, wherein the light source comprises a laser source.

9. (Currently Amended) The ultrasound system of claim 8, wherein the optical detector is configured for converting the optically modulated analog signals to corresponding digital signals.

10. (Currently Amended) A method for generating an image, the method comprising:  
~~sensing a plurality of signals and generating corresponding electrical signals;~~  
sensing ultrasound signals,  
converting the ultrasound signals to analog electrical signals;  
receiving optical signals from a light source;  
modulating the optical signals with the analog electrical signals to generate a corresponding plurality of optically modulated analog signals;  
converting the plurality of optically modulated analog signals to a corresponding plurality of digital signals; and  
processing the plurality of digital signals to generate the image.

11. (Original) The method of claim 10, wherein the plurality of signals comprise ultrasound signals.

12. (Currently Amended) The method of claim 11, wherein sensing further comprises an amplifying the electrical signals.

13-16. (Canceled)